



Hello. [Sign in](#) to get personalized recommendations. New customer? [Start here](#).

[Your Amazon.com](#) | [Today's Deals](#) | [Gifts & Wish Lists](#) | [Gift Cards](#)

Your Dig

Shop All Departments

Search

Books

[Advanced Search](#)

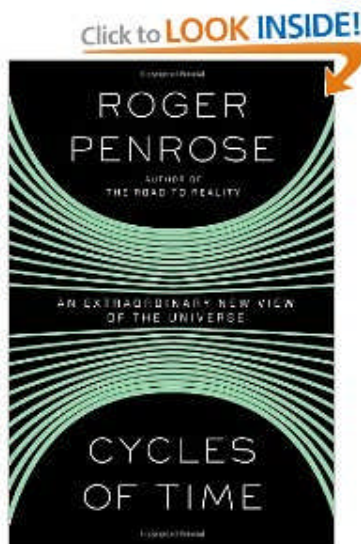
[Browse Subjects](#)

[New Releases](#)

[Best Sellers](#)

[The New York Times® Best Sellers](#)

[Children's Books](#)



Cycles of Time: An Extraordinary New View of the Universe [Hardcover]

[Roger Penrose](#) (Author)

(14 customer reviews) | (113)

List Price: ~~\$28.95~~

Price: **\$17.62** & eligible for **FREE Super Saver Shipping** on orders over \$25. [Details](#)

You Save: **\$11.33 (39%)**

In Stock.

Ships from and sold by **Amazon.com**. Gift-wrap available.

Want it delivered Tuesday, March 20? Order it in the next **33 hours and 51 minutes**, and choose **One-Day Shipping** at checkout. [Details](#)

42 new from \$13.28 **33 used** from \$11.98
1 collectible from \$49.95

[Share your own customer images](#)
[Search inside this book](#)



FREE Two-Day Shipping for students on millions of items. [Learn more](#)

Formats	Amazon Price	New from	Used from
Hardcover	\$17.62	\$13.28	\$11.98
Paperback	\$10.85	\$10.85	--
Audio, CD, Audiobook, Unabridged	\$25.55	\$19.92	\$16.99
Unknown Binding	--	\$31.95	--
Audible Audio Edition, Unabridged	\$20.95 or Free with Audible 30-day free trial		



Sell Back Your Copy for \$2.62

Whether you buy it used on Amazon for [\\$11.98](#) or somewhere else, you can sell it back through our Book Trade-In Program at the current price of [\\$2.62](#).

Book Description

Publication Date: **May 3, 2011** | ISBN-10: **0307265900** | ISBN-13: **978-0307265906**

From the best-selling author of *The Emperor's New Mind* and *The Road to Reality*, a groundbreaking book on three of cosmology's most profound questions: What, if anything, came before the Big Bang? What is the universe? What is its ultimate future?

Current understanding of our universe dictates that all matter will eventually thin out to zero density, with evaporating away into massless energy. Roger Penrose—one of the most innovative mathematicians of our predominant picture of the universe's "heat death," arguing how the expected ultimate fate of our accelerating universe can actually be reinterpreted as the "Big Bang" of a new one.

Along the way to this remarkable cosmological picture, Penrose sheds new light on basic principles that u

universe, describing various standard and nonstandard cosmological models, the fundamental role of the background, and the key status of black holes. Ideal for both the amateur astronomer and the advanced p exciting insights for each—*Cycles of Time* is certain to provoke and challenge.

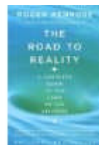
Intellectually thrilling and accessible, this is another essential guide to the universe from one of our pree

Frequently Bought Together

Customers buy this book with [The Road to Reality: A Complete Guide to the Laws of the Universe](#) by Roger Penrose
Paperback **\$15.83**



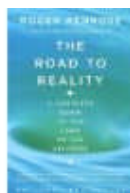
+



Price For Both: \$33.45

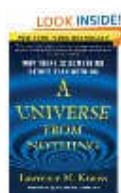
[Show availability and shipping details](#)

Customers Who Bought This Item Also Bought



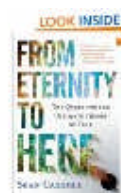
The Road to Reality: A Complete Guide to the Law... by Roger Penrose
(185)

\$15.83



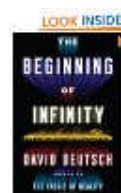
A Universe from Nothing: Why There Is Somet... by Lawrence M. Krauss
(106)

\$15.30



From Eternity to Here: The Quest for the Ultimate... by Sean Carroll
(60)

\$11.56



The Beginning of Infinity: Explanations That Tra... by David Deutsch
(32)

\$17.24

Editorial Reviews

Review

"The hyper-density of this book made my brain feel simultaneously wiped out and dazzled."
-*Boston Globe* Best Science Books of 2011

"Radical . . . A surprising and unorthodox work disguised in the jacket of a popular science book, *Cycles of Time* is deeply enlightening and just as deeply mystifying for anyone who dares to follow along."
-Peter Voit, *The Wall Street Journal*

"An intellectual thrill ride . . . As Penrose builds a solid foundation for his argument in analyzing universal gravitation and Newton's Second Law, the reader senses something tremendous looming—mysterious and compelling cosmological page-turner."
-Y. S. Fing, *Washington Independent Review of Books*

"If you'll forgive a skiing metaphor, *Cycles of Time* is a black diamond of a book. But like all steep slopes, it's a moment from your struggles and look up, and in front of you is an utterly gorgeous view."
-Anthony Doerr, *Boston Globe*

"Profound . . . This fascinating book will surely become a classic in the history of cosmology."
-*Choice*

"Controversial but intriguing . . . Well worth the effort."
-*Kirkus*

"Intriguing . . . Penrose makes provocative arguments for his challenging new theory."
-*Publishers Weekly*

About the Author

Roger Penrose is Emeritus Rouse Ball Professor of Mathematics at the University of Oxford. He has received numerous awards, most notably the Wolf Foundation Prize in physics, which he shared with Stephen Hawking. He has written several previous books, including *The Emperor's New Mind*. He lives in Oxford, England.

Product Details

Hardcover: 304 pages

Publisher: Knopf (May 3, 2011)

Language: English

ISBN-10: 0307265900

ISBN-13: 978-0307265906

Product Dimensions: 6.4 x 1.1 x 9.5 inches

Shipping Weight: 1.4 pounds ([View shipping rates and policies](#))

Average Customer Review: [\(14 customer reviews\)](#)

Amazon Best Sellers Rank: #155,145 in Books ([See Top 100 in Books](#))

Would you like to [update product info](#), [give feedback on images](#), or [tell us about a lower price](#)?

More About the Author

> [Visit Amazon's Roger Penrose Page](#)



Discover books, learn about writers, read author blogs, and more.

Customer Reviews

14 Reviews

5 star: (5)
 4 star: (2)
 3 star: (2)
 2 star: (4)
 1 star: (1)

Average Customer Review
 ([14 customer reviews](#))

Share your thoughts with other cus

Most Helpful Customer Reviews

180 of 184 people found the following review helpful

A Mathematical Origin to the Universe?,
 October 16, 2010

By **Dr. Roy Simpson** (Hertfordshire, UK) - [See all my reviews](#)

This review is from: [Cycles of Time: An Extraordinary New View of the Universe \(Hardcover\)](#)

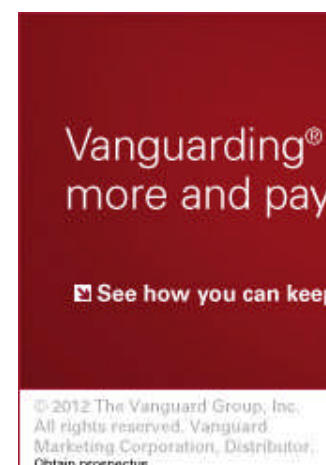
Many who wish to buy this book will be familiar with the other works of Professor Roger Penrose (such as The Road to Reality). Some will be curious to learn about a new theory of the origin of the Universe. This book presents a radical new idea which Penrose has been developing in the past few years on the Big Bang: essentially the idea is that there was a pre-Big Bang era and there will be a post-Big Crunch era too.

So one could review both the book and the idea itself. Firstly some will worry about the level of mathematics presented in this book. In the main chapters there are equations such as $S = k \log V$ - Boltzmann's Equation. If you are not comfortable with this, then maybe you will not get the most from the book. However if you are comfortable with this and similar physics equations and numbers then the first section of the book is readable. Of course there are plenty of diagrams too. There is some hard maths however and this has been relegated to the Appendix (30 pages). This maths is very advanced and another of Penrose's technical books (Penrose and Rindler Volume 2) would be needed to understand it fully - so that is only for the experts. Given that the reader wont be learning this material in the present book it shows that there is some more complex machinery behind the scenes needed to comprehend the full idea.

In the first section the book returns to an old concern of Penrose namely the entropy present in the early universe: less than today - but why so much less? The chapter then focusses in on the Big Bang described using "Conformal Diagrams". The key on page 115 is important for reading these diagrams.

Part 3 introduces the new idea called Conformal Cyclic Cosmology (CCC). Here we learn something about the idea that the Big Bang is merely a transition in the longer history of the universe. To get the most out of the mathematics in this section one needs to understand the idea of the conformal metrics introduced. Fortunately there are no calculations about it in the main text, but the idea needs to be understood. In order to develop the CCC hypothesis Penrose then needs to consider various physics issues: entropy, black hole information loss, the presence of mass in elementary particles. A novel use of other work in these areas provides for an interesting basis for the CCC hypothesis as we also study the far future of the Universe. Finally we close with some observational details from the Cosmic Background Data being gathered by satellites. So CCC is a physically testable theory!

If you are interested in another theory being presented at the forefront of Cosmology and Physics then this is for you. Also it provides another view of Penrose's approach to these subjects which is different from the mainstream. But beware that some of the mathematical ideas (of conformal infinity) go quite deep indeed - easily the subject of another book if this idea is successful!

**Most Recent Customer I****This is a painf**

In all fairness to Penrose, of this audio book is the v voice that projects weakne throat, from a reader that understands none... [Read](#)

Published 8 days ago by jacques b i

Disappointed

Excessive detail on the fur obscures the big picture m author references at the b thoroughly disappointing, clarity and better balance.

Published 1 month ago by JB

Absolute bloo**stars**

I did not know what to exp when it was purchased. Sc a work horse of my cosmo [Read more](#)

Published 2 months ago by Andrew

Beautiful but v

Penrose puts forth an old of our universe is the star a beautiful new way. [Read](#)

Published 4 months ago by Light Pe

Fascinating

Sir Roger Penrose, Emerit Professor of Mathematics i Oxford, has written anothe book. [Read more](#)

Published 5 months ago by William I

Help other customers find the most helpful reviews

Was this review helpful to you?

[Report abuse](#) | [Permalink](#)

[Comments \(20\)](#)

91 of 98 people found the following review helpful

Seduced by Math, May 6, 2011

By **Patrick J. Sullivan** (Miami, FL United States) - [See all my reviews](#)

Amazon Verified Purchase ([What's this?](#))

This review is from: Cycles of Time: An Extraordinary New View of the Universe (Hardcover)

Roger Penrose's latest book is an exposition of his latest cosmological speculations. As usual Penrose cheerfully overestimates the mathematical capabilities and accomplishments of the typical scientifically educated lay person his books are ostensibly aimed at. He presents what he sees as a baffling fact, the unusually low entropy state of the early universe, and gradually leads the reader up to his explanation of the nature of our universe. Though Penrose is coy throughout the book's first two sections about the details of his conjecture, the title gives it away and indeed this book is ultimately a speculation about cyclical universes. There are definitely some points of interest, and readers who enjoyed Penrose's earlier works such as [The Emperor's New Mind](#) will likely be intrigued by parts of the book. But while less overambitious than the author's sweeping [Road to Reality](#), Cycles of Time is far denser than more accessible popular science works such as Stephen Hawking's [A Brief History of Time](#), so those who found that bestseller to be of use mostly as bookcase filler might want to give Penrose a pass here.

The book is divided into three main sections: entropy and the Second Law of Thermodynamics; the Big Bang and the puzzling low-entropy state of the early universe; then the largest and most detailed concluding section. This section details Penrose's Conformal Cyclic Cosmology (CCC) model, a scheme whereby a tiny portion of a late-stage universe in its Big Rip phase becomes the seed of the next universe's Big Bang, and so on ad infinitum.

Also as the book progresses, the author goes through at least three voices: first the definite, lecturing one in which entropy and Big bang cosmology are presented. Then the speculative, theorizing one in which CCC is detailed. Finally he concludes on a tentative note with overtones of self-doubt. Here Penrose frankly muses aloud. He makes vague moves toward linking (A) the explosive late-stage expansion of the universe as the expansive cosmological constant λ overwhelms the dwindling effects of gravity and (B) the similarly explosive growth of the very early-stage universe in its hypothetical inflationary phase. But up until that point, Penrose has expressed nothing but skepticism regarding inflation, and in fact one of the self-described strengths of his CCC proposal is that it obviates the need for inflation altogether!

Penrose raises up CCC as the latest rival to the plain linear time Big Bang. He admits to a youthful fondness for the old Continuous Creation (CC) model, and CCC is admittedly negatively motivated by an authorial distaste for the unadorned Big Bang. On the positive motivation side, Penrose has been so captivated by a mathematical model developed by his colleague Paul Tod that he has developed it into his CCC idea. There seems to be no direct evidence for CCC, it offers no possibility for experiment, and it is probably non-falsifiable. In other words, on its merits it has a great deal in common with string theory, which Penrose has always been openly skeptical of. I refer to his seduction by math because reading Penrose enthuse over Tod's conformal map and its implication of a pre-Big Bang universe is a little like reading about Edward Witten championing string theory on the grounds of its mathematical beauty.

Disappointing

As a lay reader of popular amount and level of math knowledge required to cor in any depth is beyond wh
[Read more](#)

Published 5 months ago by r buck

Too difficult fr

It is difficult for a naive pe understand the book. Rea: strait forward and am not author

Published 6 months ago by R. Maus

A possible sce

Overall it's a good listen, I book. Some of the more s as the conclusion could ha
[Read more](#)

Published 7 months ago by Curious

great for every rather than follow

i bought the audiobook.it clear.the originality of th command of physics and n this product a must for all
[Read more](#)

Published 8 months ago by danqua

Estimability of

As a retired surveying scie of the loop inverse theory matrix (and tensor) invers to see if Penrose is applyir
[Read more](#)

Published 8 months ago by Loop In

Search Customer Review

Only search this product's review

> [See all 14 customer reviews](#)

The author is of course not the first to speculate about earlier and later Big Bangs, cyclical Big Bangs, infinite Big Bangs, Big Bounces, etc. He acknowledges as much and even devotes a brief chapter to previous pre-Big Bang theories. Oddly though, he is quite unsympathetic to rival ideas that on the surface have a great deal in common with his CCC; I am referring specifically to Andre Linde's infinite inflation model. Penrose is skeptical of inflation and the need for it and is no champion of string theory or any string-based ideas. But strings aside, anyone familiar with infinite inflation will be right at home with CCC.

So although I am left completely unconvinced by book's end about the usefulness of or the need for CCC, the foregoing thoughts should serve to demonstrate that the book has succeeded at least in getting one reader to consider Penrose's arguments and to ponder the issues he raises. If Cycles of Time can do as much for some key young physics and math students, then the author may be content.

I should mention that although the appendices are mostly repositories of even more advanced math than Penrose believed most of his readers would be comfortable with, the endnotes are of significant use while reading the text. Chore though it may be, it is a more rewarding read to keep one finger open to the notes while reading the text and flip between the two as needed. The notes explain and clarify points Penrose makes throughout the text; they are mostly not simply page references to cited works. I wish (American) publishers would realize that in many cases such as this one footnotes serve the purpose far better than endnotes; they are not just irrelevant distractions cluttering up the page margin. But this seems to be a losing battle, and Penrose's publisher, Knopf, has joined the majority in considering notes to be best tucked tidily into the back of the book, 200 pages away from the text they apply to.

Help other customers find the most helpful reviews

Was this review helpful to you?

[Report abuse](#) | [Permalink](#)

[Comments \(2\)](#)

48 of 55 people found the following review helpful

Surely not for the laymen, May 7, 2011

By

Rui Antunes "Physics nerd" (Amadora, Lisbon Portugal) - [See all my reviews](#)

This review is from: [Cycles of Time: An Extraordinary New View of the Universe \(Hardcover\)](#)

Although the cover states that the book has no complex mathematical formulae in the main text (only on the appendix), the truth is that Penrose prefers to use mathematical language over physical language on most sections of the book. For instance, in the first chapter (of the three chapters of the book), Penrose talks about the Second Law of Thermodynamics and tries to mathematically argue that the Entropy on the Big Bang (or somewhen around that time) had to be very low. So it takes him about 50 pages to explain (not very successfully) what Sean Carroll explains (very successfully) in his entire book 'From Eternity to Here'.

Penrose tries to explain his theory of cyclic universes (aeons) from a mathematical point of view, based on conformal geometry, without giving a clear explanation of its physical meaning. I could not understand, physically, how his Conformal Cyclic Cosmology differs from other cyclic theories, such as 3-brane collisions or other theories (which Penrose hardly mentions).

Penrose his a brilliant mathematician and uses that talent on Relativity

and Cosmology - the problem is that he forgets that not everybody (well, almost nobody) is as math genius. So, I will wait for some other author to write about Penrose's theory (translating it to common physical language) so that I can understand Penrose's idea...

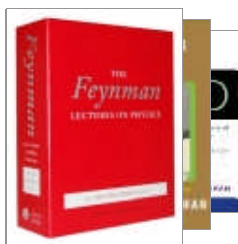
Help other customers find the most helpful reviews
Was this review helpful to you?

[Report abuse](#) | [Permalink](#)
[Comment \(1\)](#)

Share your thoughts with other customers:

> [See all 14 customer reviews...](#)

Customers Also Bought Items By





- [Douglas R...](#)
- [Lisa Randall](#)
- [F. E. Close](#)
- [Jeff Forshaw](#)
- [Stephen Hawking](#)
- [Daniel C. Dennett](#)
- [Lee Smolin](#)
- [Ernest Nagel](#)
- [David Deutsch](#)
- [Michio Kaku](#)
- [Erwin Schrodinger](#)


Inside This Book [\(learn more\)](#)


Browse Sample Pages:
[Front Cover](#) | [Table of Contents](#) | [First Pages](#) | [Index](#) | [Surprise Me!](#)
Search Inside This Book:

What Other Items Do Customers Buy After Viewing This Item?

- 

[The Road to Reality: A Complete Guide to the Laws of the Universe](#) by Roger Penrose Paperback
(185)
\$15.83
- 

[The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos \(Vintage\)](#) by Brian Greene
(123)
\$11.53
- 

[A Universe from Nothing: Why There Is Something Rather than Nothing](#) by Lawrence M. Krauss Hardcover
(106)
\$15.30
- 

[From Eternity to Here: The Quest for the Ultimate Theory of Time](#) by Sean Carroll Paperback
(60)
\$11.56

> [Explore similar items](#)

Tags Customers Associate with This Product [\(What's this?\)](#)

Click on a tag to find related items, discussions, and people.

- [cosmology](#) (3)
- [hardcover](#) (1)
- [roger_penrose](#) (1)
- [See all 4 tags...](#)

Your tags: [Add your first tag](#)

Search Products Tagge

Customer Discussions

[This product's forum](#)

[Related forums](#)

Discussion	Replies	Latest Post
<input type="checkbox"/> Cycle of Time versus Cycles of Time	0	Nov 28, 2010

> [See all discussions...](#) [Start a new discussion](#)

[Astronomy forum](#) (36 disc
[Science forum](#) (1023 discu
[Textbook forum](#) (61 discu
[Textbook Buyback forum](#)

Active discussions in related forums

Discussion	Replies	Latest Post
Science forum <input type="checkbox"/> Global warming is nothing but a hoax and a scare tactic	754	59 seconds ago
Science forum <input type="checkbox"/> Scientist fired over Intelligent Design?	202	9 minutes ago
Science forum <input type="checkbox"/> On the Predictive Value of Theory of Evolution Versus the Theory of God-Did-It	1252	14 minutes ago
Textbook Buyback forum <input type="checkbox"/> Shall we let print books get burned at the stake ?	5	2 hours ago
Textbook Buyback forum <input type="checkbox"/> My Book Listing!	2	15 hours ago
Textbook forum <input type="checkbox"/> Attention all Textbook SELLERS!!!	2	2 days ago
Textbook forum <input type="checkbox"/> sellers are deceivers	8	2 days ago
Astronomy forum <input type="checkbox"/> Age of the universe	32	6 days ago

Search Customer Discussions

Only search this product's forum

Listmania!



[Top Be Mindful Books: A list by Sky's The Limit](#)



[Teach yourself advanced math and physics: A list by Christopher Vitale "Christopher Vitale"](#)



[Understanding Time Travel in Fiction: A list by Richard H. Jones](#)

[Create a Listmania! list](#)

Search Listmania!

So You'd Like to...



[Discover How the Universe Works: A guide by Roger Guidry](#)



[create your own fictional world: A guide by Eric E. Johnson "ntohign she thaersam"](#)

Search Guides



"Know the Life & Works of Stephen Hawking".: A guide by [M. Mariba](#)
["the teacher"](#)

[Create a guide](#)

Amazon eGift: Send a Gift Card Suggesting This Item ([What's this?](#))

Instant Delivery: E-mail a gift card suggesting this item

Flexible Gifting Choices: They can choose this, or pick from millions of other items.

[Get Started](#)



We e-mail your eGift



Recipient decides what t

Look for Similar Items by Category

- [Books](#) > [New & Used Textbooks](#) > [Science & Mathematics](#) > [Astronomy & Astrophysics](#)
- [Books](#) > [Science & Math](#) > [Astronomy & Space Science](#) > [Astrophysics & Space Science](#)
- [Books](#) > [Science & Math](#) > [Astronomy & Space Science](#) > [Cosmology](#)
- [Books](#) > [Science & Math](#) > [Physics](#)

Look for Similar Items by Subject

Search **Books** by subject:

- [Science/Mathematics](#)
- [Cyclic universe theory \(Cosmology\)](#)
- [Science](#)
- [Science / Physics / Astrophysics](#)
- [Cosmology](#)
- [Cosmology \(Astronomy\)](#)

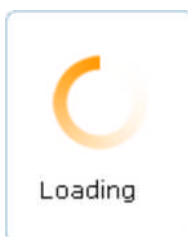
Find books matching ALL checked subjects

i.e., each book must be in subject 1 AND subject 2 AND ...

Feedback

- ▶ If you need help or have a question for Customer Service, [contact us](#).
- ▶ Would you like to [update product info](#), [give feedback on images](#), or [tell us about a lower price?](#)
- ▶ Is there any other feedback you would like to provide? [Click here](#)

Your Recent History ([What's this?](#))



Get to Know Us

- [Careers](#)
- [Investor Relations](#)
- [Press Releases](#)
- [Amazon and Our Planet](#)
- [Amazon in the Community](#)

Make Money with Us

- [Sell on Amazon](#)
- [Become an Affiliate](#)
- [Advertise Your Products](#)
- [Independently Publish with Us](#)
- [› See all](#)

Let Us Help You

- [Shipping Rates & Policies](#)
- [Amazon Prime](#)
- [Returns Are Easy](#)
- [Manage Your Kindle](#)
- [Help](#)



[Canada](#) [China](#) [France](#) [Germany](#) [Italy](#) [Japan](#) [Spain](#) [United Kingdom](#)

- | | | | | | | | |
|--|---|---|---|--|--|---|---|
| AbeBooks
Rare Books & Textbooks | AmazonLocal
Great Local Deals in Your City | AmazonWireless
Cellphones & Wireless Plans | Askville
Community Answers | Audible
Download Audio Books | BeautyBar.com
Prestige Beauty Delivered | Book Depository
Books With Free Delivery Worldwide | CreateSpace
Indie Publishing Made Easy |
| Diapers.com
Everything But The Baby | DPRReview
Digital Photography | Endless
Shoes & More | Fabric
Sewing, Quilting & Knitting | IMDb
Movies, TV & Celebrities | MYHABIT
Private Fashion Designer Sales | Shopbop
Designer Fashion Brands | Small Parts
Industrial Supplies |
| | Soap.com
Health, Beauty & Home Essentials | Wag.com
Everything For Your Pet | Warehouse Deals
Open-Box Discounts | Woot
Never Gonna Give You Up | Yoyo.com
A Happy Place To Shop For Toys | Zappos
Shoes & Clothing | |

[Conditions of Use](#) [Privacy Notice](#) © 1996-2012, Amazon.com, Inc. or its affiliates